SUPPLEMENTARY DATA

FOR

THE ROYAL COMMISSION ON ENERGY

THE BRITISH AMERICAN OIL COMPANY LIMITED

JULY, 1958

SUPPLEMENTARY DATA FOR ROYAL COMMISSION ON ENERGY

CONTENTS

Information which British American undertook to file with the Commission at hearings in Calgary

Page Reference to Transcript	
P. 5338	Supply of crude oil for Gulf's Toledo Refinery
P. 5355	Practice of refiners in the United States with regard to long term crude oil supply contracts
P. 5360	Comparison of laid-down costs at Clarkson Refinery of imported Venezuelan crude oils and Western Canadian crude oils

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Supplementary information requested by Commission staff

I. Exploration and Production

Page Reference to Transcript	
5248 and 5316	Producing potential in Western Canada
5390, 5424 and 5431	Payout period on drilling and production and replacement costs

II. Transportation

5300 - 5301	Pipe line tariffs on crude line to Montreal
5278, 5344	Economic loss from idling of ocean tanker fleet
5381	Tanker operations on Great Lakes
5386	Reversal of Trans-Northern Pipe Line

III. Petroleum Refining

5274	Availability of Canadian crude oils to supply product requirements in Eastern Canada
5278	Surplus capacity in Montreal refining area
5304	Laid-down costs of crude oil at Montreal
5403 - 5404	Profitability of refinery operations in Eastern Canada

IV. Crude Oil Markets

5260 and 5375 - 5376	Export markets for Canadian crude oil
5289 and 5364	Entry of Canadian crude oil into Montreal market
5269	Imported crude oil in domestic markets

2685 - 2695	Competitive position of natural gas in California market

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SUMMARY OF BRITISH AMERICAN'S VIEWS ON POTENTIAL MARKETS FOR WESTERN CANADIAN CRUDE OIL AND STATEMENT OF BRITISH AMERICAN'S POSITION WITH REGARD TO PROPOSAL FOR CONSTRUCTION OF PIPE LINE FACILITIES TO MONTREAL

SUMMARY OF BRITISH AMERICAN'S VIEWS ON

POTENTIAL MARKETS FOR WESTERN CANADIAN CRUDE OIL

At the conclusion of our submission on potential markets for Canadian crude oil at the hearings of the Commission in Calgary in May 1958, permission was requested to file a supplementary memorandum, summarizing British American's views on this question, and perhaps clarifying some of the points which arose in the examination of our brief.

We would first like to re-emphasize British American's position with regard to the potential market for Canadian crude oil in the Montreal refining area, and with regard to the proposal for the construction of pipe line facilities to transport Canadian crude oil to this market.

We would like to make it quite clear that British American is not opposed to the construction of pipe line facilities to serve this market if it should prove to be in the best interests of the Canadian economy and of the petroleum industry in Canada, considering all segments of the industry, to provide this additional market outlet for Canadian crude oil.

In our opinion, however, this is not the case at the present time for the reasons stated in our brief which may be

summarized as follows:

1. Assuming that it would be possible for Canadian crude oil to be competitive with imported crude oils in the Montreal refining area without a reduction in well-head price, we feel that it is most important that there should be a full appreciation of the magnitude of the task of finding the reserves that would be required to support this market over and above the increasing requirements of other domestic and export markets, as well as a full appreciation of the implications of embarking on such a program.

As pointed out in our submission, and as summarized in Schedule X (Case II), the new reserves that would be required to support the Montreal market in addition to the growing demand in other markets, would mean that the petroleum industry in Canada over the next ten years would have to find a minimum of 4.2 billion barrels of new reserves and a maximum of 6.3 billion barrels depending on the level of export demand, as compared with 3.8 billion barrels of reserves found in Western Canada to date.

The capital requirement for the exploration and development program that would have to be undertaken to find and develop these reserves could approach $10 billion. In our opinion, this would impose a serious strain on the industry's capital resources, and would of necessity require

large investment of equity capital from outside Canada that would further reduce Canadian ownership of oil and gas resources.

We believe that to a very considerable extent, the current over-supply situation in Western Canada is to be attributed to the intensified exploration and development activity that followed the discovery of Leduc in 1947, without too much thought being given to the development of markets. Further impetus was given to this activity during the period of the Suez crisis in late 1956 and early 1957. As a result, producing potential in Western Canada has increased at a very rapid rate, from 19,000 barrels per day in 1947, to 365,000 barrels per day in 1954 and to 870,000 barrels per day in 1957. (Table on page 6 of brief).

Average daily production also increased rapidly and reached 71.4 per cent of producing potential in 1954. Three highly successful years of exploration activity in 1954, 1955 and 1956 added nearly 1.4 billion barrels to reserves in Western Canada, with the result that, even with increases in the rate of average daily production of about 33 per cent in 1955 and again in 1956, production as a per cent of producing potential declined from the high point of 71.4 per cent reached in 1954 to 61.6 per cent in 1956. In 1957 there was a further decline in this ratio to 57 per cent as average daily production increased by only 7.4 per cent over the previous year, as against an increase of 16 per cent in producing potential.

Clearly, the rapid rate of development in Western Canada over the last ten years has been stimulated by the eagerness of producers to participate in the expanding market for Canadian crude oil.

An additional market outlet in Montreal would undoubtedly act as a spur to renewed exploration activity in Western Canada on a much greater scale than we have had to date. This would, of course, provide an immediate benefit to the economy but, if successful, would eventually lead to a position of over-supply similar to that in which the industry finds itself to-day.

Once underway, an exploration program of this magnitude stimulated by a sudden large increment in demand, inevitably gains a momentum which carries it far beyond the point where adequate reserves have been developed for existing markets. We believe this has been clearly evidenced by the experience in Western Canada in the last ten years, and that inevitably, history would repeat itself, and sooner or later the industry would again find itself in the position in which it is to-day with production at little more than 50 per cent of producing capacity.

Accordingly, while the entry of Canadian crude oil into the Montreal market would give an immediate relief to the current over-supply situation in Western Canada, it would, in

our opinion, only further aggravate the situation over the longer term.

Any immediate relief that might be provided by an additional market outlet in Montreal would only be obtained at considerable cost to the Canadian economy - either in a reduction in well-head price to the producer in Western Canada to enable Canadian crude oil to be competitive with imported crude oil in the Montreal market, or if no such reduction were made, in an increased cost of refined products in the Montreal area that would necessarily have to be reflected in higher product prices to the consumer in areas supplied by Montreal refineries.

It is especially difficult for us to see any reason to burden the economy with this additional cost, or to undertake an accelerated program of exploration and development that would inevitably lead to a similar situation of over-supply as that confronting the industry to-day, in view of the prospects for continuing growth in demand for Canadian crude oil in markets served by existing pipe line facilities.

Referring to page 24 of our brief, it is quite evident that pipe line facilities to transport Canadian crude oil to Montreal could not be completed and in operation before 1961 at the earliest. As there stated, even without the Montreal market, we expect industry production to exceed 68 per cent of producing

potential by 1962, and an exploration program of something in the order of 1,000 exploratory test wells per year will be required to support this anticipated growth in demand. This projection assumes a level of export demand of only 134,000 barrels per day in 1962. (Case I B - Schedule X).

Successive increases in allowables for Alberta in June and July are already beginning to confirm our estimate of average daily production for 1958. We believe that the liquidation of refiners' inventories and the completion of refinery shut-downs which were the main contributing factors to the low level of production in the second quarter of 1958 have now run their course, and that production for the remainder of the year will continue at a high level.

There appears to be some misunderstanding as to the shift in demand from Montreal to the Toronto refining area that is anticipated in 1962 in our projections, as a result of which the Trans-Northern Products Pipe Line is expected to be reversed for the shipment of products out of the Toronto refining area in an easterly direction as far as the junction of Trans-Northern's spur line to Ottawa.

Some question also appears to have arisen as to how products refined in the Toronto area could displace products refined in the Montreal area in view of the substantial advantage in laid-down cost enjoyed by imported crude oils at Montreal over the laid-down cost of Canadian crude oil in the Toronto refining area.

The main point that appears to have been overlooked is the fact that the bulk of this anticipated shift in demand from Montreal to Toronto is accounted for by products now being supplied out of Montreal into the metropolitan area of Toronto itself and to points west of Toronto, with only a comparatively small portion of this demand accounted for by shipments out of Montreal via Trans-Northern, west of the spur line to Ottawa to points east of Toronto.

Referring to Appendix B on page 36 of our brief, throughout our projections we have assumed that the Cornwall and Ottawa Valley areas will continue to be supplied with products refined in Montreal from imported crude oils, although it is quite conceivable that with the reversal of Trans-Northern in 1962, the over-all economics of supply could be such that the Cornwall and Ottawa Valley areas could be economically supplied with products refined in the Toronto area from Canadian crude oil.

The main point, however, is that no significant increase in demand for Canadian crude oil is anticipated in our projections to supply product requirements east of Toronto, and the competitive advantage that refiners in the Montreal area enjoy from the standpoint of a lower laid-down cost for crude oil will be offset by transportation charges incurred in shipping refined products from Montreal to Toronto.

We cannot conceive of any more conclusive evidence as to the competitive position in the Toronto market of products refined from Canadian crude oil in the Sarnia and Toronto areas as opposed to products refined in the Montreal area from imported crude oils, than the fact that all refiners who have an established market in the Sarnia-Toronto area large enough to warrant construction of a refinery, have already constructed refineries in this area, and are currently supplying their product requirements in the area out of these refineries, or are planning to do so in the near future.

2. We do not believe, for the reasons stated in our submission, that Canadian crude oil could be competitive with imported crude oils in the Montreal refining area without a substantial reduction in well-head price, so that import quotas or tariffs would be necessary to force entry for it into this market.

Again, the main factor which has lead us to this conclusion is our projection of the potential market for Canadian crude oil in the Montreal refining area.

As explained in Appendix A of our brief, this projection was based on comprehensive forecasts of growth in consumption of petroleum products in the areas concerned. These were translated into crude oil requirements and allocated to refinery areas in the light of anticipated developments in the industry.

As shown in Schedule II to our submission, and as explained in detail on pages 32 to 34, we estimate that the potential market for Canadian crude oil in the Montreal refining area will not exceed 240,000 barrels per day in 1961, declining to 205,000 barrels per day in 1962, and increasing gradually to 261,000 barrels per day in 1967.

This sharp decline in 1962 reflects the shift in source of supply from Montreal to the Toronto refining area for that portion of the forecast demand for products in Ontario west of the Cornwall and Ottawa Valley area that is now being supplied out of the Montreal refining area via Trans-Northern Pipe Line.

As previously noted in this memorandum, most of this demand is in the metropolitan area of Toronto itself and points west of Toronto. We can see no reason why the enforced use of Canadian crude oil at Montreal would change this picture as we believe that the over-all economics of supply for the Toronto area will dictate the refinery expansion in the Toronto area on which this shift in demand is predicated.

Accordingly, we feel that our projection of the potential market for Canadian crude oil in the Montreal refining area, in taking into account factors which appear to have been overlooked in other projections, gives a more realistic indication of the levels of throughput that could be expected for a crude oil pipe line to Montreal.

With a potential market for Canadian crude oil in the Montreal area as we see it of only 205,000 barrels per day in 1962, increasing gradually to only 261,000 barrels per day in 1967, we are unable to accept as realistic, estimates of the cost of transporting crude oil from Western Canada to Montreal by pipe line which are based on much higher levels of throughput and on a rate of return on investment which, in our opinion, would be inadequate for a project of this nature.

Accordingly, we believe that a substantial reduction in well-head price would be necessary to enable Canadian crude oil to be competitive with imported crude oils in the Montreal refining area.

Effect of a Reduction in Well-Head Price

In considering the effect of a reduction in well-head price, we believe the most important factor to be considered is the cost of replacement of the reserves that would be committed to supplying this market over the long term. In our opinion, on the basis of average industry experience in the cost of finding and developing reserves in Western Canada in recent years, any substantial reduction in well-head prices below current levels would reduce the rate of return on investment to the point where it would not provide adequate incentive for the industry to undertake the large scale expenditures that would be necessary to find and develop the reserves required to support this market.

While some producers in Western Canada might be satisfied to take a reduction in well-head price in order to permit a more rapid recovery of existing reserves, for those companies who are also engaged in refining and marketing in Canada, and are therefore concerned with maintaining adequate reserves in relation to refinery crude oil requirements over the longer term, replacement of existing reserves is a major consideration far outweighing the short-term gain that would result from increased production of existing reserves.

Alternative to a Reduction in Well-Head Price

Apart from subventions, the only alternative to a reduction in well-head price, as we see it, would be an increase in the selling prices of refined products in areas supplied by refineries in Montreal, to compensate for the higher laid-down cost of Canadian crude oil. This, we believe, would be inevitable because of the narrow profit margins on refining and marketing operations and comparatively low rate of return on capital employed in these operations at current price levels. In our opinion, therefore, the refining and marketing segment of the industry could not absorb the increased cost of refined products that would result from the enforced use of Canadian crude oil at their Montreal refineries without increasing the prices of refined products in the area supplied by these refineries.

It has been suggested that refiners in the Montreal area who are also producers in Western Canada would be able to recover any additional cost that might result from the use of Canadian crude oil in their refining operations from the additional income they would realize from their share of increased production in Western Canada, and, therefore, would not incur financial loss as a result of the use of Canadian crude oil at Montreal.

It is certainly true that refiners in the Montreal area, by virtue of their large share of production in Western Canada, stand to gain most from any increase in production. In our opinion, however, the offsetting of higher laid-down costs for crude oil from increased income from production would amount to a subsidizing of refining and marketing operations at the expense of income from production that will be realized in any event. In view of the extremely low rate of return on capital employed in refining and marketing operations at the present time, we can see no justification whatever for subsidizing these operations in this manner.

Similarly, an increase in prices of refined products to compensate for higher laid-down costs for Canadian crude oil would, in our opinion, amount to a subsidizing of crude oil production in Western Canada at the expense of the consumer of petroleum products in Eastern Canada. Again, we can see no

justification whatever for such action in view of the excellent prospect for continuing growth in both domestic and export markets where Canadian crude oil enjoys a competitive advantage in laid-down cost over crude oil from other sources.

3. We believe that, in general, Canadian refiners have clearly demonstrated their desire to utilize Canadian crude oil in their operations to the greatest extent that is economically possible, and that their announced plans for further expansion in areas accessible to Canadian crude oil with existing pipe line facilities leave no doubt as to their intention to continue to do so.

4. For these reasons, British American is of the opinion that an orderly eastward expansion of markets for Canadian crude oil in areas served by existing pipe line facilities is the logical course for the industry to follow to increase production of Canadian crude oil, rather than to seek expansion by leap-frogging into the Montreal refining area where Canadian crude oil would be at a definite competitive disadvantage in laid-down cost with imported crude oils and where uneconomic backhaul movements of refined products into major marketing areas would be necessary.

We believe also that along with this eastward expansion, the prospect for development of export markets that would be economically more favourable to the Canadian producer is such as to assure a continuing healthy growth of the industry.

5. Again, I would like to stress the fact that our submission was directed towards an examination of potential markets for Canadian crude oil, both domestic and export, and was not in opposition to any particular proposal for construction of pipe line facilities to serve the Montreal refining area.

If for any reason the situation as we see it at the present time should change, and it should become economically feasible without artificial restraints on imports or other protective measures, for Canadian crude oil to gain entry to the Montreal market in competition with imported crude oils, and in the interest of the Canadian economy and of the petroleum industry in Canada that it should do so, British American would definitely be in favour of such a move.

INFORMATION WHICH BRITISH AMERICAN UNDERTOOK
TO FILE WITH THE COMMISSION AT HEARINGS IN CALGARY

CRUDE OIL SUPPLY FOR TOLEDO REFINERY OF GULF OIL CORPORATION

(Page 5338 of Transcript)

British American's wholly-owned producing subsidiary in the United States, The British-American Oil Producing Company, does not supply any crude oil to Gulf Oil Corporation's Toledo Refinery.

The British-American Oil Producing Company does have a very limited amount of crude oil production in some states of the Mid-Continent area of the United States which are a source of crude oil supply for refineries in the Toledo area. It is conceivable that through blended pipe line streams or exchange and trading transactions, some portion of the Producing Company's production in this area might be said to be indirectly supplied to Gulf's refinery at Toledo. It is impossible, however, to determine whether or not this is so, and in any event, the volume would be negligible.

PRACTICE OF REFINERS IN THE UNITED STATES
WITH REGARD TO CRUDE OIL PURCHASE CONTRACTS

(Page 5355 of Transcript)

From inquiries we have made we understand that it is the general practice of independent refiners in the United States to obtain their crude oil requirements on an open division order basis, usually with no commitments for more than 30 days.

It is not unusual, however, for an independent refiner to enter into a long term arrangement for crude oil supply, under which the supplier agrees to take back specified volumes of finished products from the refinery.

Long term supply contracts are also found where a crude oil supplier has given financial assistance in construction of the refinery as a means of ensuring a long term outlet for crude oil production.

COMPARISON OF LAID-DOWN COST OF IMPORTED CRUDE OILS AND CANADIAN CRUDE OIL AT CLARKSON REFINERY

(Page 5360 of Transcript)

The laid-down cost of the specialty crude oils that British American is planning to import from Venezuela for the manufacture of asphalt at Clarkson Refinery in 1958 is estimated as follows:

	Laid-Down Cost per Barrel (Canadian Funds)
Boscan	$2.93
Tia Juana Medium	3.37

As was pointed out in the hearings at Calgary, these are specialty crude oils brought in specifically for the manufacture of asphalt. They are low gravity crude oils (10° API for Boscan and 26° API for Tia Juana Medium) and have quite different characteristics from the main crude oil streams coming into Clarkson from Western Canada via Interprovincial Pipe Line. Accordingly, there is no basis for comparison of their laid-down cost with the laid-down cost of Redwater or other light gravity crude oils from Western Canada.

With regard to the competitive laid-down cost of imported crude oils in the Toronto refining area on completion of the St. Lawrence Seaway, we estimate that the cost of transporting crude oil

from Montreal to Toronto by tanker via the Seaway would range from approximately 23 cents per barrel for larger tankers with capacities in the order of 100,000 barrels, to 38 cents per barrel for smaller tankers of 25,000 barrels capacity.

This additional transportation cost would be added to the laid-down costs shown for imported crude oils at Montreal in Exhibit 5 to our submission to arrive at their laid-down costs in the Toronto refining area.

SUPPLEMENTARY INFORMATION REQUESTED BY COMMISSION STAFF

I. EXPLORATION AND PRODUCTION

PRODUCING POTENTIAL

(Pages 5248 and 5316 of Transcript)

In order to compare the producing potential in the future with what it is at the present time, it is necessary to arrive at a consistent method of computing the potential for any future time. Since the rate at which an oil province can produce is determined to a large extent by the remaining reserve, it is felt that the reserve is the most reliable factor on which to base the producing potential.

The maximum rate at which a well in Alberta or Saskatchewan is permitted to produce is controlled, in part, by a comparison with a hypothetical well having a 10 year life: i.e., maximum production for 10 years would deplete the reserve. It is not considered good engineering practice or in the interests of conservation to produce more than 10 percent of the reserve per year except in cases where a well cannot be operated economically if produced at such a rate. A look at the producing potential in Western Canada for the past several years shows that a rate equivalent to 10 percent of the reserve per year is a good average. Saskatchewan's producing rate is currently almost exactly 10 percent of the reserve per year. In the United States the producing rate has never exceeded 10 percent of the remaining reserve even during World War II when the industry was producing at its maximum efficient rate.

In our brief we have added reserves at a rate of 400,000 barrels per exploratory test drilled, which was Western Canada's experience for the period 1951 - 1957. Assuming an exploratory well program of 1,000 wells (comparable to 1957) about 400 million barrels of reserves will be discovered annually in the future. By subtracting total production, we computed the remaining reserve for Western Canada and converted 10 percent per year to a daily basis to obtain the producing potential in barrels per day as shown on Column 10, Schedules XI and XII, of the brief. For the year 1958, this method would result in a producing potential slightly less than the average for 1957 computed from actual industry statistics. Since the potential will probably not drop in 1958, we kept it the same as 1957 but for subsequent years have computed the producing potential on the basis of producing 10 percent of the remaining reserve per year.

PAYOUT PERIOD AND EFFECT ON FINDING COSTS

(Pages 5390, 5424 and 5431 of Transcript)

Wells being drilled by British American in an oil field recently discovered in Northern Alberta should pay out the drilling costs in approximately 4 years at the low rates of production experienced in the past few months. If Alberta's total allowable production were increased by 200,000 B/D this payout for the wells only would be reduced to about 2.5 years.

However, fast payouts which accompany high rates of production can cause increases in the cost of finding oil in a potential area such as Western Canada. The primary reason is that the prospect of fast payouts attracts large amounts of capital to the industry and the high demand generates large amounts of cash for exploration. The terms involved in land deals or "farm outs" tend to be more favorable in times when the demand is high and considerable drilling is done, by the people taking the farm out, to acquire an interest in the land. Under these conditions more wells are drilled than would normally be necessary and rank wildcatting often replaces the careful and thorough planning so necessary to the efficient operation of an exploration program. As a result, finding costs are almost certain to go up.

II. TRANSPORTATION

II. TRANSPORTATION

EDMONTON-MONTREAL PIPE LINE

(Pages 5300 and 5301 of Transcript)

We estimate that a pipe line tariff to Montreal of 61 cents per barrel would be required for a 6 per cent return on investment, based on the expansion and extension of the Interprovincial system and a throughput to Montreal of 240,000 barrels per day.

As was stated at the hearings in Calgary, our estimates of the cost of transporting Canadian crude oil to Montreal were not based on detailed engineering studies of the capital cost and operating expenses under the alternative proposals of extending Interprovincial's system and an independent line. Our estimates of these costs do not, however, differ materially from other estimates that have been submitted to the Commission, and any differences that may exist would not materially affect the cost of transportation.

On the other hand, our projection of the potential market for Canadian crude oil in the Montreal refining area, and of the probable level of throughput of a pipe line to Montreal was based on a comprehensive and detailed study of growth in consumption for petroleum products in the areas concerned, and took into account the shift in source of supply

from Montreal to Toronto that would result from the refinery expansion planned in the Toronto area in the near future.

On the basis of this study, we believe that the level of throughput to Montreal of 240,000 barrels per day on which our tariff was calculated (equivalent to our projection of the potential market for Canadian crude oil in Montreal in 1965 or 1966) to be a realistic figure on which to evaluate the economics of any proposal for a pipe line to Montreal.

The other major factor which would materially influence the tariff to Montreal is, of course, the rate of return on investment that would be adequate to ensure successful financing of the project. We feel that the 8 per cent rate of return used in our tariff calculation is reasonable for a project of this nature with the type of throughput guarantee that would normally be given by refiners using the line.

COST OF CANCELLING OCEAN TANKER COMMITMENTS

(Pages 5278 and 5344 of Transcript)

Any estimate of the cost to British American of cancelling its ocean tanker commitments in the event of Canadian crude oil displacing imported crude oil in Montreal, must necessarily be based on certain arbitrary assumptions.

Based on prevailing conditions in the ocean tanker market which we believe are likely to continue for some time barring an international emergency such as the Suez crisis, we estimate the loss that would be incurred by British American in cancelling its ocean tanker commitments as of the beginning of 1961 at something in the order of $4.7 million.

This loss would be restricted to two vessels and is made up of an estimated loss of $1.4 million on the sale on the open market of one vessel owned by the Company, and an estimated cost of $3.3 million to lay up the second vessel for the unexpired four-year term of her charter. This second vessel is a very large tanker of approximately 41,000 tons dead weight and a capacity of approximately 283,000 barrels. In our opinion, based on current market conditions, it would not be possible to sub-charter a vessel of this size except at a rate which would be so prohibitively low as to make it more economical for the Company to lay her up for the remainder of her charter.

TANKER OPERATIONS ON GREAT LAKES

(Page 5381 of Transcript)

The figure of 28 cents per barrel that was given in evidence at the hearing as the cost of transporting crude oil from Superior to Clarkson relates to the cost of transporting crude oil in the B A PEERLESS which has a capacity of 120,000 barrels and is the only vessel of its size employed in crude oil service on the Great Lakes.

The estimated cost of 35 cents per barrel to transport crude oil from Clarkson to Montreal is the cost of transporting crude oil in smaller tankers of only 16,000 to 20,000 barrels capacity of the type normally employed on the Great Lakes and St. Lawrence at the present time.

With the completion of the Seaway, larger vessels of the size of the PEERLESS will be able to navigate the St. Lawrence, and the cost of transporting crude oil to Montreal is estimated as follows:

	From Superior to Montreal	From Clarkson to Montreal
	(Cents per Barrel)	
Larger vessels of approximately 100,000 barrels capacity	49.3	23.4
Smaller vessels of approximately 25,000 barrels capacity	93.5	37.9

TRANS-NORTHERN PIPE LINE

(Page 5386 of Transcript)

The reversal of Trans-Northern Pipe Line by 1962 is not merely a proposal put forward at a Trans-Northern meeting, but is a target date agreed upon by the owner companies for reversal of the line.

Trans-Northern has notified a contract shipper for whom it is moving products through the line at the present time of its intention to discontinue this service after 1961, and a similar reply has been given to inquiries from other sources as to the availability of this service after 1961.

III. PETROLEUM REFINING

SELECTION OF APPROPRIATE CRUDES

(Page 5274 of Transcript)

Regarding the argument presented that the use of Canadian crude oil in Montreal refineries would result in greater middle distillate and residual fuel import requirements than if the lower gravity Venezuelan crude were continued to be used:

(a) The derivation of the 35° gravity Redwater crude that was used in our original presentation was developed as shown on the attached schedule. The actual production in 1957 including not only the heavier gravity fields in Alberta but also the more prolific heavier gravity fields in Saskatchewan was pro-rated out to the total barrels of the net weighted average gravity on the assumption that additional production and even future reserves would have the same gravity pattern as existing production. These quantities were increased to meet the 1958 requirements for product and equivalent crude oil based on the yields shown. All of the heavy gravity crude available was consumed in the export western Canada and Ontario markets for asphalt and bunker production and even then the bunker requirements for western Canada were not met. Some western Canadian crude of higher gravity was down-graded by using the flexibility in refinery yields

to meet this portion of the bunker market. In Ontario, the heavy crude oil available did not satisfy the asphalt demand and some of the asphalt demand was met from the inferior quality lighter gravity crudes. Imports of both heavy white and bunker were indicated.

(b) Regarding the flexibility of modern refineries to vary yields to meet the market demand, it is true that there is considerable flexibility in this regard in a modern refinery. However, the existing demand pattern in Canada is such that the yields of heavy white shown in eastern Canada are essentially maximum for the gravity of crude shown and existing equipment and technology. Increasing the bunker yield tends to decrease the heavy white yield by virtue of the cut-back material to meet viscosity specifications. Essentially, the yield flexibility in a refinery is such that by lowering the gravity of the crude, the decreased price of crude will compensate for the lower realization on the higher yield of bunker, however, this will be limited by either the economics of this balance based on the cost of crude and the import price of bunker or the gravity of the crude available. Thus, with the higher gravity Canadian crude that would be available to go to Montreal, higher imports of bunker would be required. The breakeven point economically will vary depending on the individual refiner's circumstances, but on the average since even without any limitation on gravity at Montreal using imported crudes,

the 31° gravity represents the average imports into this area and still indicates substantial imports of bunker.

(c) It is true, as we have stated in our original submission, that the requirements for heavy white or middle distillate may be over-estimated if gas succeeds in obtaining a large portion of the heating oil market. This factor, however, is taken into account in our estimates and the bulk of the increase in heavy white requirements is based on the use of this material for purposes other than home heating. We have pointed out above that the middle distillate yield is essentially maximum for the crudes available and the existing refinery facilities and technology. As pointed out on page 30 of our submission, we therefore believe that if the heavy white requirements are too high, this would only tend to reduce the import requirements.

ESTIMATED INDUSTRY REFINERY YIELDS
YEAR 1958

(in thousands of barrels)

(Page 5274 of Transcript)

	LIGHT CRUDES				HEAVY CRUDES				PRODUCT SUPPLY & DEMAND				TOTAL CRUDE OIL REQUIRED		TOTAL CRUDE OIL AVAILABLE	
	API Gravity	Product	%	Volume	API Gravity	Product	%	Volume	Domestic Prodn.	Avge % Yield	Demand	Imports	Bbls	API Gravity	Bbls	API Gravity
Total Available													-	-	275,837	35.2°
West Coast																
1) Export													14,600	37.0°	261,237	35.1°
2) Domestic	36.0°	Gasoline	35%	8,685	un-	Gasoline	un-	129	8,814	35.0%	8,814	-				
		Heavy White	33%	8,184	known	Heavy White	known	122	8,306	33.0%	11,675	3,369				
		Black	23%	5,704		Black		85	5,789	23.0%	9,155	3,366				
		Conversion	9%	2,227		Conversion		33								
		Total Crude	100%	24,800		Total Crude		368					25,168	36.0°	236,069	35.0°
Prairie Provinces																
1) Export													21,900	26.5°	214,169	35.9°
2) Domestic	39.5°	Gasoline	48%	25,981	18.0°				25,981	43.2%	25,981	-				
		Heavy White	32%	17,321					17,321	28.8%	17,232	-				
		Blk(Bunker)	12%	6,495		Bunker	42%	1,752	9,913)							
		Blk(Asphalt)	-	-		Asphalt	50%	2,084	2,084)	19.9%	11,997	-				
		Conversion	8%	4,330		Conversion	8%	334								
		Total Crude	100%	54,127		Total Crude	100%	4,170					60,148	38.0°	154,021	35.0°
Additional to meet bunker demand (90%)				1,851												
Ontario	36.0°	Gasoline	38%	31,477	14.0°	Gasoline	11%	-	31,477	37.0%	31,477	-				
		Heavy White	32%	26,507		Heavy White	26%	572	27,079	31.8%	30,276	3,197				
		Others	9%	7,455		Others	-	-	7,455	8.8%	7,452	-				
		Black	12%	9,940		Black (asph)	55%	1,210)	11,392	13.4%	13,300	1,908				
		Conversion	9%	7,455		Black (bkr)		242)								
		Total Crude	100%	82,834		Conversion	8%	176								
						Total Crude	100%	2,200					85,034	35.4°	68,987	34.6°
Montreal																
1) Domestic	34.6°	Gasoline	38%	26,215					26,215	38%	26,215	-				
		Heavy White	32%	22,076					22,076	32%	31,315	9,239				
		Others	9%	6,208					6,208	9%	5,676	(532)				
		Black	12%	8,278					8,278	12%	23,513	15,235				
		Conversion	9%	6,210												
		Total Crude	100%	68,987									68,987	34.6°	-	-
2) Imported	31.0°	Gasoline	35%	26,215					26,215	35%	26,215	-				
		Heavy White	35%	26,215					26,215	35%	31,315	5,100				
		Others	3%	2,247					2,247	3%	5,676	3,429				
		Black	18%	13,482					13,482	18%	23,513	10,031				
		Conversion	9%	6,741												
		Total Crude	100%	74,900												

WESTERN CANADA CRUDE OIL PRODUCTION

	1957 Actual Bbls	1957 Actual API Gravity	1958 Requirement
Alta Lt.	135,082	36.9°	203,510
Alta Hvy	2,408	17.4°	3,628
Sask Lt.	23,460	34.9°	35,344
Sask Hvy	13,386	20.4°	20,167
Manitoba	6,090	33.0°	9,175
Condensate	2,664	50.0°	4,013
Total	183,090	35.2°	275,837

PETROLEUM REFINING (Continued)

SURPLUS REFINING CAPACITY IN MONTREAL REFINING AREA

(Page 5278 of Transcript)

Any additional refinery capacity constructed in the Montreal refining area in the near future would, of course, increase the surplus capacity anticipated in the area in 1962, and intensify the competition between refiners for available markets that can be economically supplied from Montreal.

To the extent that a new refiner in the area would be able to capture a share of the total available market, and to the extent that the capacity of a new refinery in the area would be utilized to supply this market, the shares of other refiners in the area would of course be reduced. Any such reduction, however, is likely to be spread over the refiners already established in the area more or less in proportion to their existing shares of the available market, and in the case of any one refiner is not likely to be too serious or to result in any deferment of plans for refinery expansion in other areas.

PETROLEUM REFINING (Continued)

LAID-DOWN COSTS OF CRUDE OIL AT MONTREAL

(Page 5304 of Transcript)

It is quite true that the competitive advantage in laid-down cost of 45 cents per barrel that we believe Kuwait crude oil would have over Canadian crude oil in the Montreal refining area would apply, at the present time, to only about 15 per cent to 20 per cent of the total volume of crude oil being imported into Montreal.

For the first six months of the current year deliveries of Kuwait crude oil to Montreal refineries accounted for only about 17 per cent of the total deliveries through the line, although possibly there were some direct tanker deliveries of Kuwait to Montreal of which we have no knowledge.

As pointed out on page 21 of our brief, however, it is nevertheless a fact that this differential of 45 cents per barrel in favour of Kuwait crude oil represents a real penalty that would be incurred by refiners in the area who are utilizing Kuwait crude oil in their operations if they were forced to switch over to Canadian crude oil. We felt that this should be brought to the attention of the Commission as well as the differential of 26 cents per barrel in favour of Venezuelan crude oil.

We feel also that if new refining capacity is constructed in the Montreal area, the proportion of Kuwait crude oil consumed in the area is likely to increase.

COMPARISON OF LAID-DOWN COSTS SUBMITTED TO COMMISSION

The apparent discrepancy in the laid-down cost of 31° gravity Venezuelan crude between British American's figure of $3.24 and the figure of $3.07 shown in other submissions is explained as follows.

As pointed out on page 39 of Appendix C, for purposes of comparison and to eliminate the effect of fluctuations in the rate of exchange between Canadian and United States currencies, British American in its calculations of laid-down costs assumed that Canadian and United States funds were at par of exchange.

British American also took the average of seven major companies' postings for 31° Venezuelan crude oil, whereas the lowest posting was used in the calculation in other submissions.

British American assumed a higher tanker rate of USMC -40 than the rate of USMC -45 used in other submissions.

The reconciliation of British American's figure of $3.24 with the figure of $3.07 in other submissions is as follows:

Laid-down cost in other submissions in Canadian funds	$3.07
Discount of 3% on United States funds	0.09
Laid-down cost in other submissions in United States funds	$3.16
Difference in posted price	0.06
Difference in ocean tanker rate	0.02
Laid-down cost used by British American	$3.24

PROFITABILITY ON REFINING AND MARKETING OPERATIONS IN EASTERN CANADA

(Pages 5403 and 5404 of Transcript)

Information on the profitability of British American's refining and marketing operations in Eastern Canada has been filed with the Chairman of the Commission.

On page 20 of our submission we estimated that the laid-down cost of Redwater crude oil at Montreal would be 26 cents per barrel higher than the laid-down cost of the Venezuelan crude oil that is being run at our Montreal Refinery at the present time.

In the first five months of 1958, some 5.7 million barrels of crude oil were run at British American's Montreal East Refinery. An increase of 26 cents per barrel on this volume would have increased the Company's cost of refined products by nearly $1.5 million.

IV. CRUDE OIL MARKETS

IV. CRUDE OIL MARKETS

EXPORT MARKET

(Pages 5260 and 5375-76 of Transcript)

For the reasons given on pages 13 to 15 of our submission, we did not feel that it was possible at this time to assess accurately the potential export market for Western Canadian crude oil, and accordingly we considered three different levels of export demand, the bases for which were explained in detail on pages 37 and 38 of Appendix B to our submission.

The forecast by the Petroleum Department of the Chase Manhattan Bank of a potential market for Canadian crude oil on the West Coast of the United States of 420,000 barrels per day in 1966 may appear on the optimistic side in the light of the current world-wide over-supply of crude oil. It nevertheless represents an informed opinion on the subject, arrived at from an analysis of probable long-term trends in consumption of petroleum products in the free world and particularly in the United States, and of the probable disposition of available crude oil resources on a world-wide basis to supply the anticipated demand for petroleum products.

The outlook for potential export markets for Canadian crude oil can change radically from time to time with changing conditions in the world petroleum situation. What might appear to be an optimistic forecast under a particular set of circumstances prevailing at any particular time, could well prove to be conservative as the factors governing supply and demand for crude oil in world markets change. Historically, forecasts of consumption of petroleum products and crude oil have been conservative and have fallen far short of actual growth in consumption.

In our opinion, therefore, it is quite possible that the export market for Canadian crude oil on the West Coast of the United States could reach the level forecast in the Chase Manhattan Bank study, and we could not agree with the suggestion that no really large export market for Canadian crude oil in the United States can open up until the late 1960's.

CRUDE OIL MARKETS (Continued)

ECONOMICS OF ENTRY OF CANADIAN
CRUDE OIL INTO MONTREAL MARKET

(Pages 5289 and 5364 of Transcript)

We would certainly not suggest that the Montreal market could not be taken care of from the standpoint of producing potential in Western Canada, or that the petroleum industry could not meet the challenge of the large scale program for exploration and development that would be necessary to find and develop the reserves that would be required to support the Montreal market over and above the increasing requirements of other domestic and export markets.

Nor do we suggest that the increased production that would result from an additional market outlet in Montreal would not bring an immediate short term gain for those producers in Western Canada who would participate in this increased production.

As pointed out in the summary of British American's views on potential markets for Canadian crude oil included in the supplementary data filed with the Commission, this immediate short term gain to the producer in Western Canada would only be obtained at considerable cost to the Canadian economy - either in the form of a reduction in well-head price to enable Canadian crude oil to be competitive with imported crude oils in the Montreal market, or in the form of increased cost of refined

products in the Montreal area that would necessarily have to be reflected in higher prices for products to the consumer.

This additional burden of cost to the Canadian economy is a major consideration weighing against the entry of Canadian crude oil into the Montreal market. In addition, for the reasons outlined in the summary of our views on this question referred to above, we do not believe that an additional market outlet in Montreal would offer anything but a temporary solution to the problem of over-supply in Western Canada. In our opinion, the inevitable result of an eccelerated program of exploration and development in Western Canada on the scale that would be required to find and develop the reserves needed to support this market would be a situation of over-supply similar to that which confronts the industry to-day.

As pointed out in our submission, we believe that the prospect for continuing growth in domestic and export markets served by existing pipe line facilities is such that production will reach 68 per cent of producing potential in 1962 with exploration activity maintained at approximately the same level as was reached in the record year of 1957.

In essence, what we are recommending is an orderly development of reserves geared to the excellent prospects for growth that we anticipate in markets where Canadian crude oil is not at a competitive disadvantage with crude oil from other sources,

rather than precipitate action at this time to force Canadian crude oil into the Montreal market at considerable over-all cost to the Canadian economy, and with the inevitable result, sooner or later, of creating the same problem of over-supply as exists in the industry to-day.

It is not at all difficult to conceive of a change in conditions in the petroleum industry in Canada, even assuming no relative change in the world petroleum situation, that would make it economic to transport Canadian crude oil to Montreal.

With the gradual expansion of the Interprovincial system to supply the increasing crude oil requirements of refining areas now served by Interprovincial, the facilities of the line would be gradually developed to the point where they could handle the additional throughput that would be required to supply the Montreal market as far east as Toronto. It might well be economically possible at that time to extend the system from Toronto to Montreal and to transport Canadian crude oil to Montreal at a pipe line tariff that would allow it to be competitive with imported crude oils in the Montreal refining area.

A series of major discoveries in Western Canada in the next few years could increase crude oil reserves to the point where there would be an adequate surplus of reserves to take care of the foreseeable requirements of all potential markets, domestic and export, including the Montreal refining area, without the need

for the accelerated program of exploration and development that would be necessary to find and develop the reserves required to support these markets at the present time.

What is contemplated here is a situation with regard to crude oil reserves, comparable to that which exists with regard to reserves of natural gas in Western Canada to-day, where we have large volumes of surplus gas available for export, and an export market is required to maintain a healthy development of the industry.

DOMESTIC MARKETS

(Page 5269 of Transcript)

We, of course, have no assurance other than the announced intention of refiners in the Sarnia-Toronto area, that they will be operating completely on Canadian crude oil by 1960.

We believe, however, that the same economic forces that led to British American's decision to expand its refinery capacity in the Toronto area in order to utilize Canadian crude oil in supplying its product requirements in the area, will apply to all refiners located in the Sarnia-Toronto area, and will eventually lead to complete elimination of imported crude oils. Any imports of crude oil into the area that might continue after 1960 would not, in any event, materially affect our projection of potential markets for Canadian crude oil.

COMPETITIVE POSITION OF NATURAL GAS IN CALIFORNIA MARKET

COMPETITIVE POSITION OF NATURAL GAS

(Pages 2685 to 2695 of Transcript)

This is in answer to a question raised in your letter of June 25, 1958 concerning the competitive position of natural gas with respect to other fuels in California. We have compared the San Francisco city gate price of gas from Alberta as estimated by Alberta and Southern Gas Company in their export application before the Alberta Conservation Board with the posted tank car price for bunker fuel in San Francisco and the same prices in the Toronto area using the Trans Canada prospectus as a reference source for the gas. This comparison is as follows:

	Gas Cents per MCF		Bunker $ per Barrel
San Francisco	48	(Rate of 400 Million Daily)	2.75
	40	(Rate of 800 Million Daily	
Toronto	44.1	(90% Load Factor)	3.29
	49.3	(75% Load Factor)	

If you require additional information, please so advise and we will attempt to obtain it for you.